Claims

[c1]   What is claimed is:

1. A method to implement a Smart Device Network Application Infrastructure that supports and facilitates the development, deployment and management of device networks and device network applications, the method comprising the following steps: Having a SDNA processing platform with an Application Services module, a Management Services module, a Database Services module, and a Smart Network Services module.

2. A method as in Claim 1 in which said Management Service module implements the platform's core functionality and comprises the following components:

a) Coordination and Transactional Services which functions as an arbiter in the interaction of any two or more SDNA platform components, transaction support, synchronizing between concurrent SDNA platform processes, such as SDNA platform management service, applications, or development tools and handling SDNA platform events, such as device network events, application events, user events, and database events;

b) Entity Management Services which controls all aspects of SDNA platform entities which are a logical abstractions within the SDNA platform, including user management, device and device group management and resource ownership management;

c) Resource Control Repository which contains detailed information about every resource in the SDNA platform infrastructure, including whether it is being used, how it is being used and what process or application is using it;

d) Application Management Services which controls application activation and deactivation, and handles all application upgrades and it controls what system resources are made available to each application;

e) Logging Management Services which register all events and transactions occurring in any SDNA layer, and implements a semantic data filter generator that permits the creation of a comprehensive collection of data filters which can be used to produce reports or interfaces to other systems;

f) Data Management Services which is comprised of data transformation services and data integration services; and

g) Customer Management Services which implements services that operate as interfaces between SDNA platform's internal data structures and other systems.

3. A method as in Claim 1 in which said Application Service comprises the main support for SDNA platform applications and the entry point of applications into said SDNA platform and comprises the following components: a) Deployment Services which provide tools for remote installation, deinstallation, configuration, deployment and updating of an application; b) Integration Services which construct, monitor and provide tools for the configuration of communication channels among applications; and c) Gateway Interface Services which provides support for an applications" presentation layers.

4. A method as in Claim 1 in which said Smart Network Services implement SDNA platform's networking capabilities, including all inter-device communication and messaging functionality and comprises the following components: a) Basic Network Services which implements the fundamental communication processes of SDNA platform; b) Global Addressing which constitutes a method of source routing that implements device-to-device communications across hybrid device network based on packet communications; c) Protocol Morphing which is a method of emulation of basic network services emulating all basic network services that are not implemented by the underlying network technology; and d) Device Functionality Emulation Services which provides support services to emulate the desired device functionality.

5. A method as in Claim 1 in which said Database Services implements all functionality required for efficient data storage, access and manipulation and comprises the following components: a) The SDNA Database which is a database that stores all data related to SDNA platform operation; b) Query and Data Manipulation Services which are tools to execute direct data queries and modifications to the SDNA Database; c) Abstraction Support which allows the generation of abstract data objects derived from a logical combination of simpler data objects; and d) Clustering, Redundancy and Backup Services which creates an extra layer of data protection to guarantee data integrity and availability in case of database engine failure.

6. A computer program wherein the base component has interfaces and the

program code for: Having a SDNA processing platform with an Application Services module, a Management Services module, a Database Services module, and a Smart Network Services module.

7. A computer program as in Claim 6 wherein the base component has interfaces and the program code for said Management Service module to implement the platform's core functionality and comprises the following components: a) Coordination and Transactional Services which functions as an arbiter in the interaction of any two or more SDNA platform components, transaction support, synchronizing between concurrent SDNA platform processes, such as SDNA platform management service, applications, or development tools and handling SDNA platform events, such as device network events, application events, user events, and database events; b) Entity Management Services which controls all aspects of SDNA platform entities which are a logical abstractions within the SDNA platform, including user management, device and device group management and resource ownership management; c) Resource Control Repository which contains detailed information about every resource in the SDNA platform infrastructure, including whether it is being used, how it is being used and what process or application is using it; d) Application Management Services which controls application activation and deactivation, and handles all application upgrades and it controls what system resources are made available to each application; e) Logging Management Services which register all events and transactions occurring in any SDNA layer, and implements a semantic data filter generator that permits the creation of a comprehensive collection of data filters which can be used to produce reports or interfaces to other systems; f) Data Management Services which is comprised of data transformation services and data integration services; and g) Customer Management Services which implements services that operate as interfaces between SDNA platform's internal data structures and other systems.

8. A computer program as in Claim 6 wherein the base component has interfaces and the program code for said Application Service to comprise the main support for SDNA platform applications and the entry point of applications into said SDNA platform and comprises the following components: a)

Deployment Services which provide tools for remote installation, deinstallation, configuration, deployment and updating of an application; b) Integration Services which construct, monitor and provide tools for the configuration of communication channels among applications; and c) Gateway Interface Services which provides support for an applications" presentation layers.

9. A computer program as in Claim 6 wherein the base component has interfaces and the program code for said Smart Network Services to implement SDNA platform's networking capabilities, including all inter-device communication and messaging functionality and comprises the following components: a) Basic Network Services which implements the fundamental communication processes of SDNA platform; b) Global Addressing which constitutes a method of source routing that implements device-to-device communications across hybrid device network based on packet communications; c) Protocol Morphing which is a method of emulation of basic network services emulating all basic network services that are not implemented by the underlying network technology; and d) Device Functionality Emulation Services which provides support services to emulate the desired device functionality.

10. A computer program as in Claim 6 wherein the base component has interfaces and the program code for said Database Services to implement all functionality required for efficient data storage, access and manipulation and comprises the following components: a) The SDNA Database which is a database that stores all data related to SDNA platform operation; b) Query and Data Manipulation Services which are tools to execute direct data queries and modifications to the SDNA Database; c) Abstraction Support which allows the generation of abstract data objects derived from a logical combination of simpler data objects; and d) Clustering, Redundancy and Backup Services which creates an extra layer of data protection to guarantee data integrity and availability in case of database engine failure.